ABSTRACT

MEDICAL INSTRUMENTS AND TECHNIQUES FOR THERMALLY-MEDIATED THERAPIES

A surgical instrument for thermally-mediated therapies in targeted tissue volumes and for causing thermal effects in polymer tissue-contacting members. In one embodiment, the instrument has a working end with an interior chamber that is supplied with a biocompatible liquid. An energy source causes a liquid-to-vapor phase change within the interior of the instrument. The vapor phase media then is ejected from the working surface of the instrument, and a controlled vapor-to-liquid phase change in an interface with tissue applies thermal energy substantially equal to the heat of vaporization to ablate tissue. The vapor-to-liquid phase transitions, or internal energy releases, can be provided about thin-film flexible structures for engaging body lumens and cavities. An exemplary embodiment can be used for shrinking, sealing, welding or creating lesions in tissue—while causing limited collateral thermal damage and while totally eliminating electrical current flow in the engaged tissue.